JVC

# SERVICE MANUAL

## MODEL
# JL-F45

## DIRECT DRIVE
## FULLY AUTOMATIC
## TURNTABLE

No. 2378
June 1976

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**NOTE**
This service manual covers following types and territories.

| | | | | | |
|---|---|---|---|---|---|
| J type | ..... | U.S.A. | A type | ..... | AUSTRALIA |
| C type | ..... | CANADA | B type | ..... | U.K. |
| P type | ..... | PACEX, NEX, EES (MILITARY MARKET) | E type | ..... | EUROPE |
| | | | U type | ..... | OTHER TERRITORIES |

# Features

**Fully automatic mechanism**

* Automatic playing for records of all sizes – 30, 25, 17cm.
* Cueing facility protects the record surface during manual playing.
* Repeat memory facility for automatic playing repetition. Set the dial to hear up to six repetitions of a record. Or, set it for infinite repetition.
* Automatic reject facility
  To stop playing a record at any point, push the START/REJECT operation lever towards "REJECT", and the tonearm will automatically return to the arm rest.

**New gimbal support arm**

Outstanding tonearm sensitivity is assured, because bearings for clockwise/counterclockwise rotation are provided above and under the pivot bearing. Trackability is, thanks to the TH(Tracing Hold) tonearm system – the axis of the balance weight is positioned below its fulcrum – superb, and tracking characteristics are maintained even if a record is warped or if there is external vibration.

**Direct drive**

A newly developed 12-pole DC servomotor provides greatly improved performance. Highly accurate speed control and freedom from vibration are the performance features available only in the direct drive system.

**Large high-inertia platter**

Aluminium die-cast platter having a diameter of 31cm and weighing 1.6kg is employed. The stroboscope on the platter rim (33-1/3 r.p.m.) permits fine speed adjustment while a record is being played.

**Diamond stylus**

Good sound quality and long life are ensured by the diamond stylus having a tip radius of 0.5 mil.

**Anti-skating mechanism**

Anti-skating force can be adjusted corresponding to the tracking force.

# Operation

## 1. Construction diagram

Mechanical components

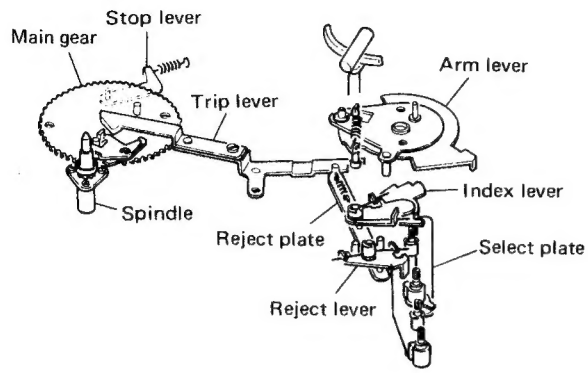



**Fig. 1**

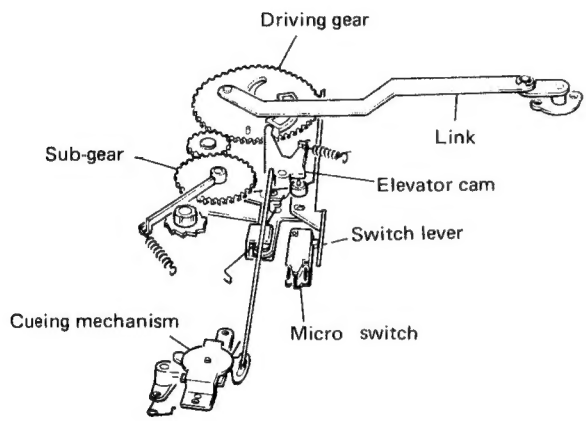



**Fig. 2**

## 2. Start mechanism

When the START/REJECT operation lever is pulled toward "START", the mechanism operates as shown in Fig. 3 to power the platter and carry the tonearm to the specified position on the record surface.

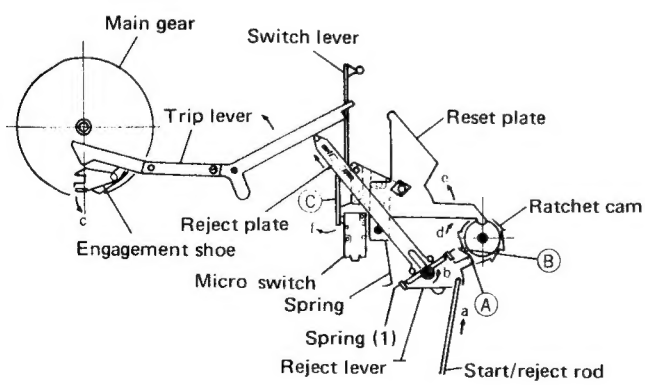



**Fig. 3**

As shown in Fig. 3, when the start/reject rod is pushed in the direction of arrow (a) the reject lever connected to the rod turns in the direction of arrow (b). At this revolution, the reject plate is pushed by the spring (1), and the engagement shoe is moved in the direction of arrow (c), beginning the starting cycle operation.

At the same time, as the reject lever is pushed in the direction of (b), the boss (B) of the ratchet cam is engaged by arm (A) to rotate the cam in the direction of (d). Consequently the reset plate is pushed away in the direction of (e).

As a result the switch lever (C) is moved in the direction of (f), and is released from the microswitch, which turns on the power. (This micro switch becomes conductive when it is separated from the switch lever.)

Fig. 4 shows the position described above.

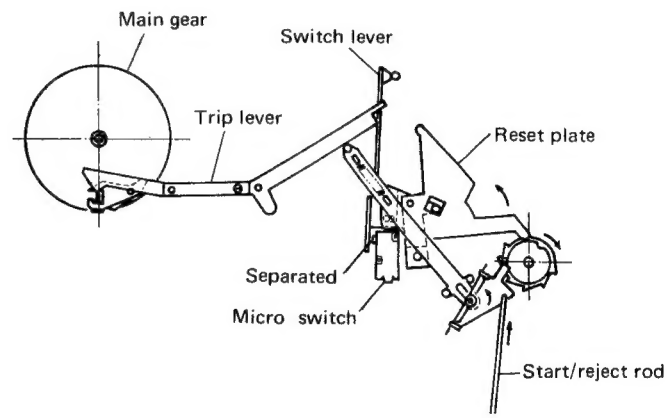



**Fig. 4**

## 3. Lead-in mechanism

When the starting cycle begins and the main gear rotates, the driving gear is turned reciprocally by the link to reciprocate the elevator cam, as shown in Fig. 5.

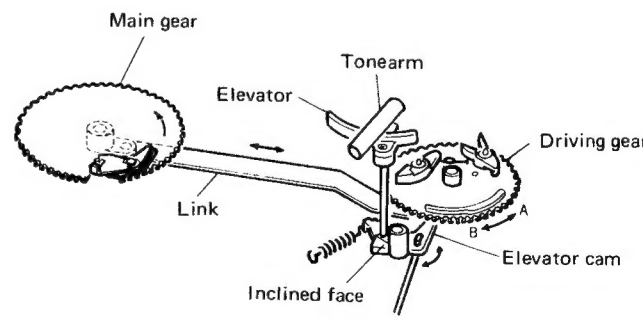



**Fig. 5**

As the elevator cam moves, its inclined face lifts the elevator, which in turn lifts the tonearm.
In Fig. 6, the lead-in lever is moved in the direction (a) by the counterclockwise rotation (A) of the driving gear, as shown in Fig. 5. As a result, the lead-in lever passes the arm lever stud (A) without touching it. Therefore, the arm lever does not move. During the next process shown in Fig. 7, the lead-in lever strikes against the reset plate and is pushed back in the direction (a). When the driving gear returns in the clockwise direction (B), this time the lead-in lever pushes the arm lever stud (B), and the arm lever stud is moved in the direction of the arrow, as shown in Fig. 8. This finishes the final stage of the lead-in operation.

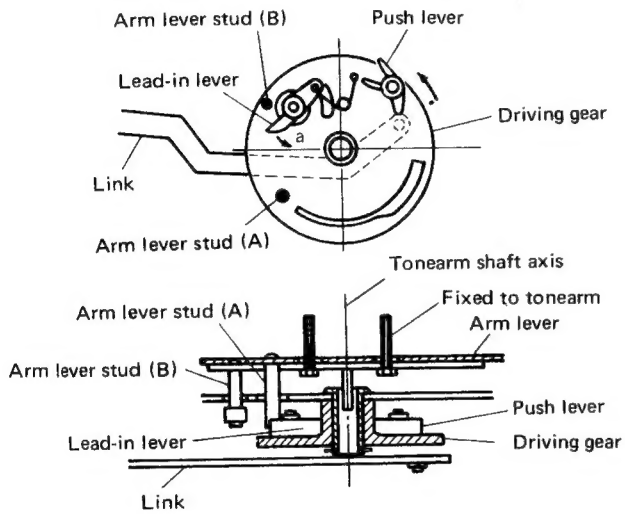



Fig. 6

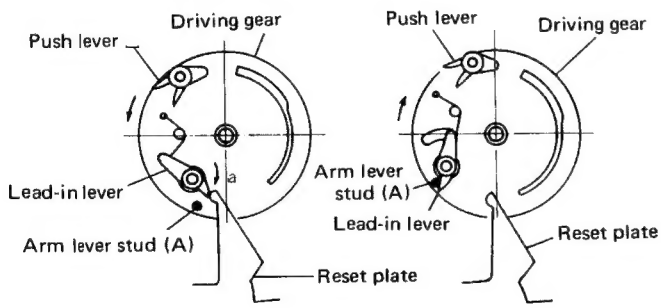



Fig. 7




Fig. 8

The stylus is positioned at the beginning of a record according to the record size (17, 25, or 30cm) chosen with the Record Size Select knob. The stylus position is determined by one of three steps on the index lever shown in Fig. 9. Part (A) of the arm lever engages the corresponding step on the index lever.
Turning this eccentric adjustment screw will move the arm lever to fine-adjust the stylus lead-in position.

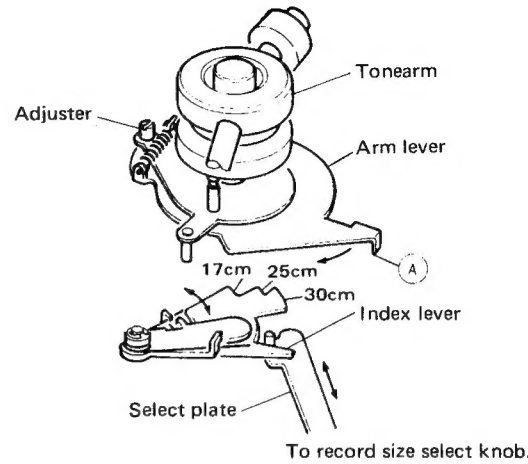



Fig. 9

## 4. Return cycle starting mechanism

The relationship between the notch in the main gear and the platter gear while a record is being played is shown in Fig. 10. In this condition the main gear does not rotate as the platter rotates because the platter gear and main gear are not engaged. As playing proceeds, however, the arm lever presses the trip lever to gradually more the lower trip and the engagement shoe on the main gear.

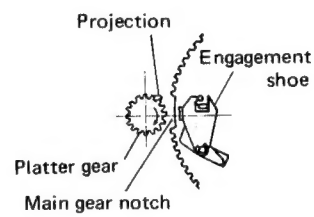



Fig. 10

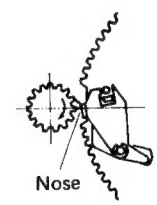



Fig. 11

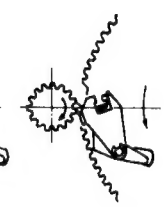


Fig. 12

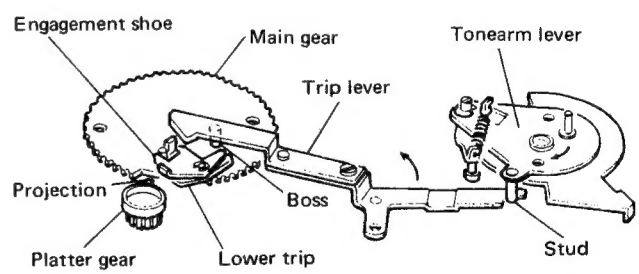



Fig. 13

The relationship between the engagement shoe and the platter gear comes to a state shown in Fig. 11. In this condition, during the time in which the pitch of the grooves is small, the movement of the engagement shoe is small. The engagement shoe is thus pushed back by the nose of the engagement shoe, the main gear being still.
When the stylus comes into the lead-out groove having a large pitch at the end of a record, the movement of the engagement shoe becomes larger than the reverse movement caused by the projection nose, entering the state which is shown in Fig. 12, where the projection presses the engagement shoe to cause the main gear to rotate.

When the main gear notch moves away, both the gears come into engagement, tripping the returning cycle.
After one complete revolution of the main gear, it will return to the position as shown in Fig. 10. The main gear will stop rotating while the platter gear is still turning.
As the main gear turns, the engagement shoe and the lower trip are returned by the outer edge of the platter gear to the original position just before the rotation of the main gear is finished. The trip lever also returns to its original position on the boss on the face of main gear halfway through the main gear rotation.

### 5. Repeat mechanism

Setting the REPEAT knob to one of the positions "1" through "6" will cause the tonearm to return from the end of record to the beginning lead-in position and play it again. The same process will be repeated up to six times, depending on the setting. Setting the knob to "R" will cause the tonearm to play the record over and over again endlessly.

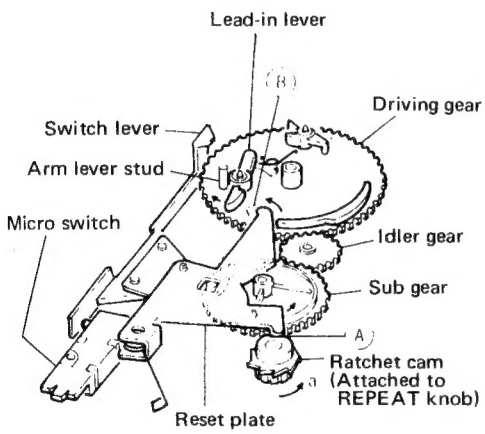



Fig. 14

As shown in Fig. 14, when the ratchet cam is turned in the direction of arrow (a) (toward the position "R" on the REPEAT knob), the part (A) of the reset plate is pushed away by the outer circumference of the ratchet cam until its part (B) is moved as far as the dotted line. Thus, the lead-in lever on the driving gear is always returned by the reset plate and pushes the arm lever stud back to bring the arm lever to the lead-in position, and the record is played again. At the "R" position the hook on the sub gear passes over the toothless section of the ratchet cam, so the cam does not turn.
If the ratchet cam is set to one of the positions "1" through "6" on the REPEAT knob, the ratchet cam and the hook on the sub gear engage after every time one record has been played, as shown in Fig. 15.
Thus the cam turns one step for each cycle. After completion of the specified number of cycles the ratchet cam and hook do not engage, and the reset plate returns to the position as shown in Fig. 14. As a result, the lead-in position. The tonearm is returned to the arm rest, and the power is turned off when the switch plate presses the micro switch.

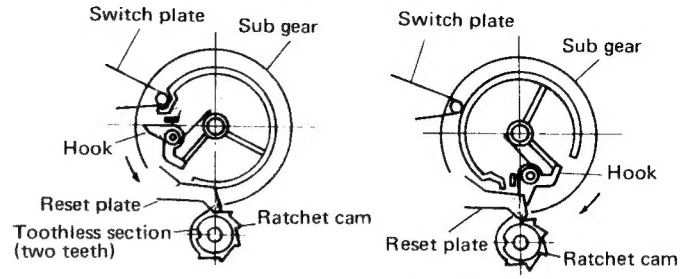



Fig. 15

### 6. Reject mechanism

If the START/REJECT lever is pushed toward "REJECT" while a record is playing, the start/reject rod moves in the direction of arrow (a), and the reject plate and trip lever are pushed by the spring (1), as shown in Fig. 16. As a result of this, the engagement shoe is moved out in the direction of arrow (c), beginning the change cycle.

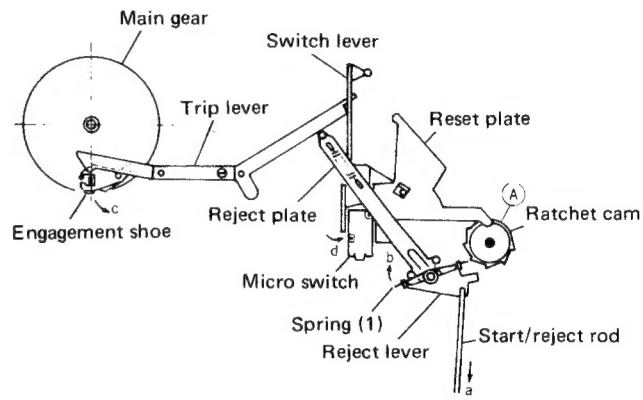



Fig. 16

If the REPEAT knob is at "1", the reset plate engages with the section (A) of the ratchet cam, and the switch lever moves in the direction of (d) to push the micro switch, turning the power off.

# Adjustment

### 1. Lead-in adjustment

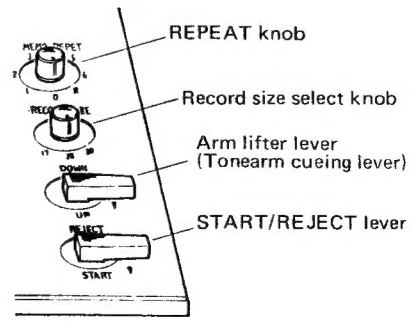



Fig. 17

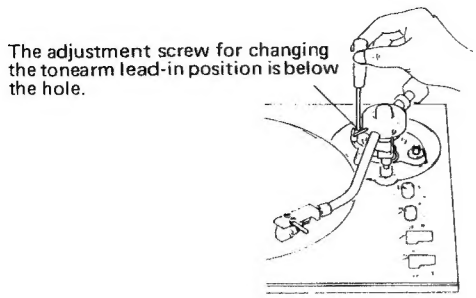



Fig. 18

The stylus lead-in position has been adjusted at the factory so that the stylus lands correctly onto the lead-in groove of a record. However, the position may need adjustment if the tonearm is replaced. Follow these steps to adjust the lead-in position:

1. Put the 30cm JVC test record (RG324) on the platter.
2. Set the RECORD SIZE select knob to "17", and start automatic playing. If the stylus comes in contact with the test record while the voice is counting in a range between 7 and 29, the lead-in position is correct. If not, turn the adjustment screw with a screwdriver clockwise to move the lead-in position towards the center of the record, where the lead-in count increases, or counterclockwise to move the lead-in position towards the outer rim of the record, when the lead-in count decreases.

**Note:** The normal lead-in count range is shown below. If you adjust so that the lead-in count is 18 for a 17cm record the lead-in count for both 25cm and 30cm records will be automatically set within the normal range.

| Normal lead-in count range | Record size |
|---|---|
| 7 – 29 | 17cm ( 7") |
| 13 – 38 | 25cm (10") |
| 5 – 34 | 30cm (12") |

## 2. Lead-out adjustment

The correct lead-out adjustment has also been made at the factory, but its adjustment is necessary after replacement of a tonearm or for other reasons, follow the steps below. Fig. 19 shows the mechanism after removal of the platter.

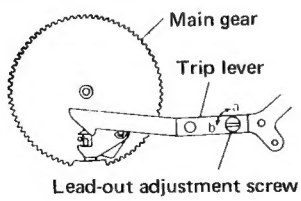



Fig. 19

* **If lead-out does not occur:**
Play the 17cm JVC test record (RG652) having a lead-out groove pitch of 3mm. If the change cycle does not begin when the stylus reaches the lead-out groove, turn the lead-out adjustment screw clockwise in the direction of arrow (a) as shown in Fig. 19.

* **If lead-out occurs too soon:**
If the change cycle begins before the stylus comes to the lead-out groove of the 17cm JVC test record (RG653, back side of RG652) turn the screw counterclockwise in the direction of arrow (b).

**Caution:** Unplug the power cord first.

1. Clamp the tonearm to the arm rest.
2. Remove the dust cover.
3. Remove the rubber mat, the platter, and the belt.
4. Turn the set upside down, and place it on blocks to protect the tonearm assembly, spindle shaft and pulley.
5. After removing the signal and power cord assemblies from the bottom board, remove the eight screws fixing the bottom board.

# Replacement of Parts

## 1. Cartridge

1. Unscrew the connector nut to remove the headshell.
2. Remove the two long screws on the headshell which hold the cartridge.
3. Connect the lead wires of the headshell to the new cartridge, being careful to match the polarities correctly. Polarity and wire colors are as follows:
   White(+) ..... L  Red (+) ..... R
   Blue(–) ..... LE  Green (–) ..... RE
4. Attach the cartridge to the headshell squarely, and gently tighten the screws.
5. Set the tonearm cueing lever to "DOWN", and then bring the sytlus tip to the overhang indicator by sliding the cartridge back and forth.
   After the adjustment, fix it firmly.
6. After attaching the cartridge, slide the headshell into the tonearm with the connector pin fitting in the groove. Tighten the connector nut.
7. Be sure to adjust the tracking force and lead-in position after replacing the cartridge.

**Note:** To play discrete 4 channel records, simply replace with the JVC stylus 4DT-Z1S the provided one.

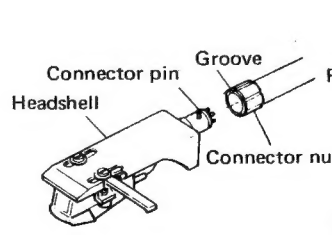



Fig. 20

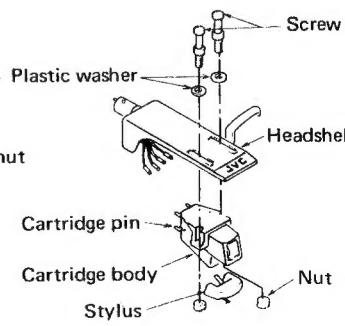



Fig. 21

## 2. Mechanism chassis

When you replace the entire mechanism (or the driving gear only), be sure to check that the lead-in lever attached to the driving gear has been returned in the direction of arrow (a) as shwon in Fig. **22**. (The lead-in lever faces in the direction of arrow (b), the mechanism may malfunction or be damaged.)

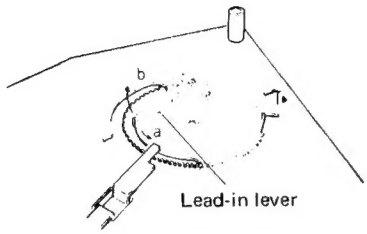



**Fig. 22**

## 3. Voltage setting (Pacex, Other Areas)

Although this set is pre-set for the use on your area's AC line voltage without any re-adjustment, it can be used on all AC voltages in the world through following adjustments.

To change the voltage, remove a bottom board, and replace the plug so that the required voltage, marked on the socket, may come out in the window of the voltage selector plug. Do not forget to replace the fuse as well with one of appropriate capacity.

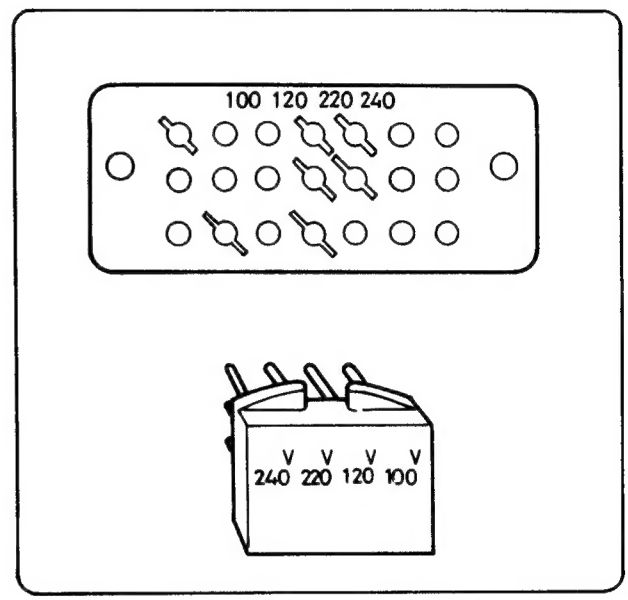



**Fig. 23**

# Block Diagram

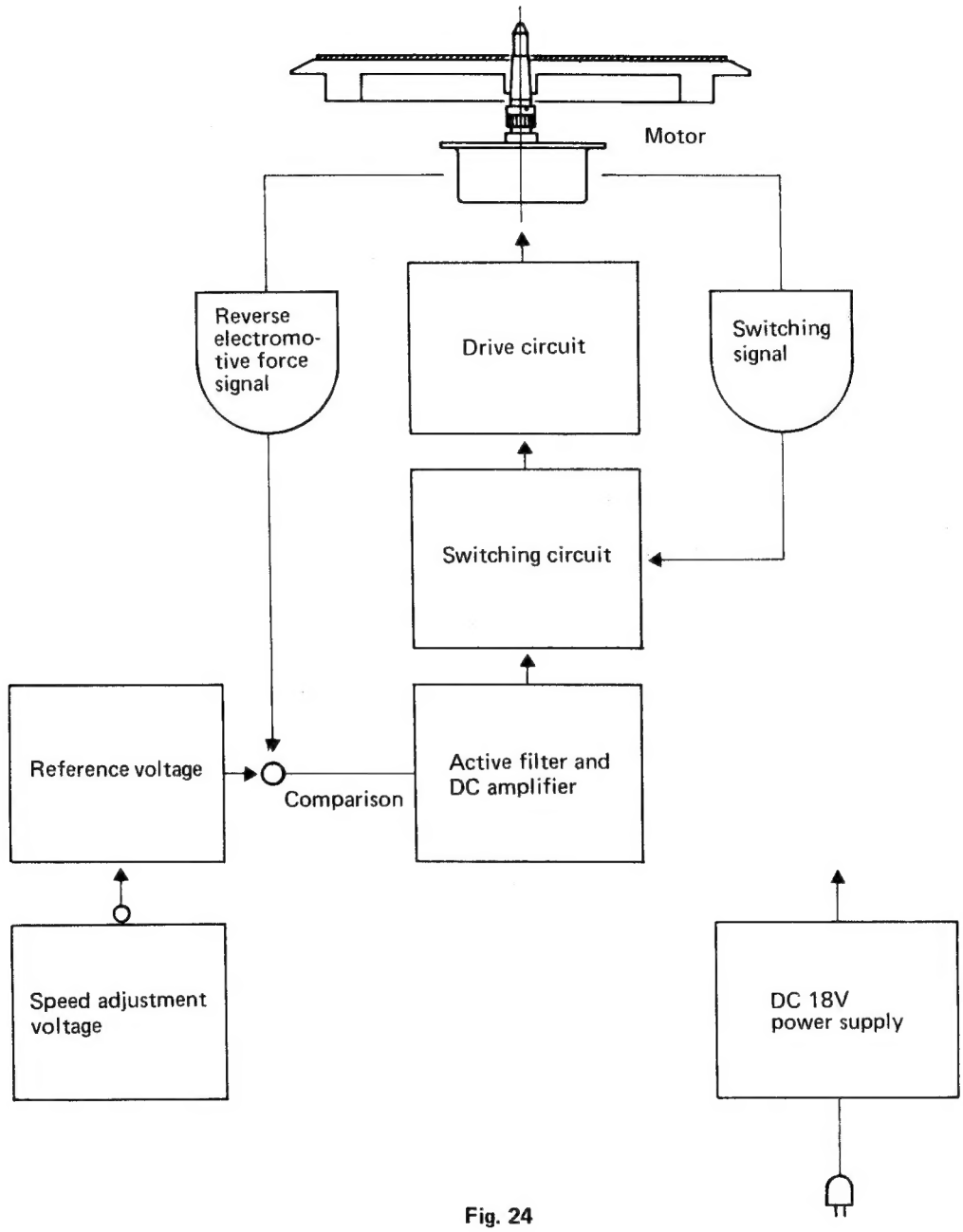



Fig. 24

* **Starting platter revolution (refer to Schematic Diagram on page 23)**

1) When the speed select knob is set to "33", switch S2 is closed (ON). For 45 rpm, switch D2 is closed. When the switch S2 is ON, the emitter of X13 is connected to the earth wire through the resisters for coarse and fine speed adjustment. The base of X13 is under a reference voltage of about 2V and the collector of X13 takes an earth level, causing the base of X12 to take an earth level at the same time.
2) This makes conductive, raising the emitter potential of X11 to make X10 conductive.
3) The conducting X10 causes X9 to become conductive. In this condition, the emitters of X5, 6 and X7, 8 are connected to the positive line, allowing the maximum current to flow.
4) Therefore, the output of the Hall elements inside the motor is amplified to the maximum degree, and transistors X1, 2 and X3, 4 connected in series to the drive coil are driven by this output, starting the revolution of the platter.
5) As the number of revolutions increases, the reverse electromotive voltage induced in the drive coil of the motor also increases gradually and, after being controlled by D1-4, is stored by C5 and R14.

6) If current flows through the base of X12, the platter rotation is accelerated. If no base current flows, the rpm of the platter tends to decrease. The collector potential of X13 is determined by its base potential and emitter resistance. When the X13 collector potential drops by more than 0.6V from the reference +18V, current flows to the base of X12, starting accelaration of the platter rotation.
7) Ripple voltage due to the reverse electromotive force remains in the collector of X12. This is similar to a sine wave of approximately 2.2Vp-p and is superimposed on the DC voltage, leading to fluctuations of revolution. To reduce the ripple voltage, X11 (avec filter), C12, C18, etc. are imployed.
8) The motor coil current flows alternately to X5, 6 and X7, 8 by switching the Hall elements. The output of X9 is driven by an alternating current of about 5Vp-p which is close to a direct current, causing the revolution to continue.
9) To ensure that the same amount of current flows to X1, 2 and X3, 4 voltage across R45 is fed back to X10. This prevents variations due to the components used.

* **Temperature compensation**

The magnetic flux density decreases with a temperature characteristic of −0.8%/°C reducing the output of the reverse electromotive force. The servo control circuit would respond as if the revolution were slowing down and act to accelerate the speed. To avoid this and maintain constant rpm despite the temperature fluctuations, D11 incorporated in the motor construction lowers the reference voltage in proportion to the temperature rise.

* **Speed adjustment**

The rpm of the platter can be changed by varying the collector current of X13, which is varied by changing its emitter resistance. The rpm drops with reduced current. Therefore, lower speeds are obtained using higher resistances and vice versa.

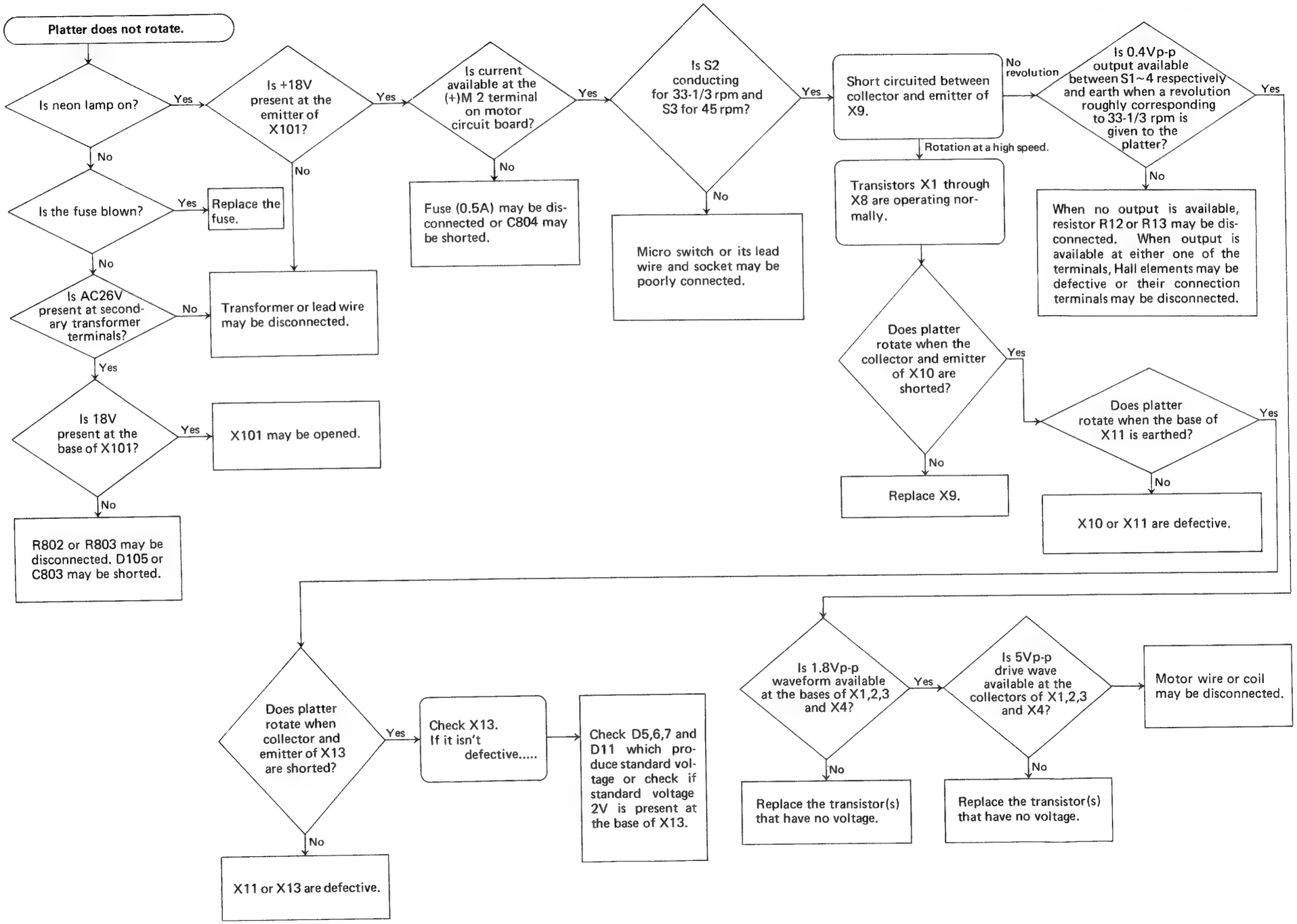
* **Power supply**

The reference voltage of 18V is generated by a transistor 2SD325(E or D), and a Zener diode. The non-adjusted output voltage is about 0.6V lower than the voltage of the Zener diode.

# Troubleshooting

| Sympton | Cause | Remedies |
|---|---|---|
| Platter does not rotate when tonearm is moved to manually or by automatic start operation. | 1. Motor is not powered.<br>2. Motor and motor circuit are defective.<br>3. Switch lever remains in contact with the switch. | * Check if the power cord is plugged in and the fuse is blown when the neon lamp also does not light.<br>* Check the transistors in the power circuit. (Check if 18V is available at the motor terminals.)<br>* Check voltage of each part of the servo circuit board.<br>* Adjust the switch lever for correct clearance. |
| Platter speed is not correct. | 1. The circuit board is out of fine adjustment. | * Adjust so that it rotates correctly for both 33 or 45 rpm. |
| Motor rotates at a high speed without being controlled by the servo system. | 1. The printed pattern is short-circuited. (Capacitors, particularly C5 should be checked carefully. | * Separate the short-circuited points. |
| Motor rotates unbalancedly. | 1. Platter is not correctly fitted on the shaft.<br>2. Any one of transistors X1-X8 is defective. | * Fit the platter on the motor shaft correctly.<br>* Check voltage for X1-X8. |
| Platter stops at a point when held by hand. (Dead point occurs.) | 1. Either one of the Hall elements is defective.<br>2. Input or output of the Hall elements is incompletely soldered. | * Replace<br>* Solder it completely. |

| Sympton | Cause | Remedies |
|---|---|---|
| Tonearm does not lead-in. (Player does not start.) | 1. Platter does not rotate.<br>2. Change cycle does not start.<br>3. Lead-in lever on driving gear is turned toward the outside of the gear and is blocked by the arm lever stud. | * Refer to the above-mentioned column.<br>* Check that the engagement shoe operates smoothly, and that it is pushed away fully when the start knob is pulled.<br>* Set lead-in lever to the proper inward position. |
| Tonearm lead-in position goes out of adjustment. | 1. Arm lever adjuster is not firmly fixed, allowing movement. | * Be sure to tighten the knurled washer to lock the adjuster. |
| Arm lifter lever moves incorrectly. | 1. The lead wires of the tonearm are too tight or tangled.<br>2. Elevator slips on the tonearm pipe. | * Slacken the lead wires to avoid any unwanted force on the tonearm pivot.<br>* Wipe the elevator face. |
| Tonearm does not stop at the correct position of a record, and moves to the inside. | 1. Index lever does not operate correctly. | * Check that the index lever operates smoothly under the action of the spring. |
| Change cycle will not stop. | 1. Trip lever and engagement shoe of the main gear malfunction. | * Check that trip lever returns after completing the change cycle, and that the engagement shoe moves smoothly and freely with its own weight. |
| No sound is reproduced while playing. | 1. Cartridge is defective.<br>2. Wiring is not correct. (Live and earth are connected inversely.)<br>3. Stylus is defective.<br>4. Amplifier is defective. | * Replace.<br>* Check the wiring.<br>* Replace. |
| Stylus does not follow the groove correctly. | 1. Dust or foreign matter is in the record groove.<br>2. Stylus is dirty or defecitve.<br>3. Lead wires in tonearm are tangled or too tight.<br>4. Tracking force is abnormal.<br>5. Tonearm bearings have too much friction. | * Clean.<br>* Clean or replace.<br>* Slacken the wires.<br>* Adjust.<br>* Replace tonearm. |
| Motor rumble is heard while playing. | 1. Motor is defective.<br>2. Transformer is defective. | * Bearing shake is excessive. Replace it.<br>* Check if the transformer is floating. |
| Tonearm does not lead-out. | 1. The lead-out groove is not standard.<br>2. Stylus does not advance. | * It may not lead out when old or non-standard records such as film records are used.<br>* Lead-out will not occur if the pitch of the lead-out groove is less than 3mm.<br>* Check if the tracking force is correct.<br>* Check if trip mechanism does not operate smoothly.<br>* Check if the stylus tip is damaged or dirty. |
| Reject operation does not work. | 1. Engagement shoe is not pushed away fully. | * Check the trip mechanism. |
| Repeat operation does not work. | 1. Switch plate malfunctions, and switch turns off. | * Check that switch plate and reset palte operate smoothly. |
| Platter does not shut off. | 1. REPEAT knob is set for repeat playing. | * Set the knob to "0". |
| Power does not turn off after reject operation with the REPEAT knob at "0". | 1. Switch is defective.<br>2. Switch button is not fully pressed by the switch lever. | * Replace.<br>* Adjust so that lever fully presses the switch button. |


Platter does not rotate.
Is neon lamp on?
Yes
No
Is the fuse blown?
Yes
Replace the fuse.
No
Is AC26V present at secondary transformer terminals?
No
Transformer or lead wire may be disconnected.
Yes
Is 18V present at the base of X101?
Yes
X101 may be opened.
No
R802 or R803 may be disconnected. D105 or C803 may be shorted.
Is +18V present at the emitter of X101?
Yes
No
Is current available at the (+)M 2 terminal on motor circuit board?
Yes
No
Fuse (0.5A) may be disconnected or C804 may be shorted.
Is S2 conducting for 33-1/3 rpm and S3 for 45 rpm?
Yes
No
Micro switch or its lead wire and socket may be poorly connected.
Short circuited between collector and emitter of X9.
Yes
No revolution
Rotation at a high speed.
Transistors X1 through X8 are operating normally.
Does platter rotate when the collector and emitter of X10 are shorted?
Yes
No
Replace X9.
Is 0.4Vp-p output available between S1~4 respectively and earth when a revolution roughly corresponding to 33-1/3 rpm is given to the platter?
Yes
No
When no output is available, resistor R12 or R13 may be disconnected. When output is available at either one of the terminals, Hall elements may be defective or their connection terminals may be disconnected.
Does platter rotate when the base of X11 is earthed?
Yes
No
X10 or X11 are defective.
Does platter rotate when collector and emitter of X13 are shorted?
Yes
No
X11 or X13 are defective.
Check X13. If it isn't defective.....
Check D5,6,7 and D11 which produce standard voltage or check if standard voltage 2V is present at the base of X13.
Is 1.8Vp-p waveform available at the bases of X1,2,3 and X4?
Yes
No
Replace the transistor(s) that have no voltage.
Is 5Vp-p drive wave available at the collectors of X1,2,3 and X4?
Yes
No
Replace the transistor(s) that have no voltage.
Motor wire or coil may be disconnected.

**Platter rotates at a higher speed.**

Does the rotation stop when the base of X9 and 18V line are shorted?

Yes → Circuit is normal between X9 and drive circuit. Check preceeding parts of the circuit.

No → Does the rotation stop when the collector of X9 is earthed?

Yes → Collector and emitter of X9 are shorted. Replace X9.

Does the rotation stop when the base of X10 is earthed?

Yes → Does the rotation stop when the base of X11 is earthed?

No → Collector and emitter of X10 are shorted. Replace X10.

Yes → Does the rotation stop when the base of X12 is connected to +17.5 line?

No → Check if collector and emitter of X11 are open. Check for incomplete soldering.

Yes → Is the resistor R16 disconnected? Is DC voltage from 4 to 6V present at the both ends of R14.

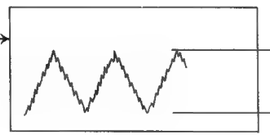
No → If no voltage is present, either C5 is shorted, or the + pole of C5 is touching the +7.5V line.

Yes → Collector and emitter of X13 are shorted.

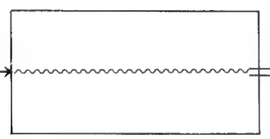
**Erratic turntable rotation**

When the condensor C5 is open → The rotation accelerates and the ripples across resistor R14 increase. Voltage changes from 40mV to 400mV. → Fluctuation is produced.

If the registor R10 or R100 is adjusted improperly.



In the case of improper adjustment, voltage changes to 120mV and rpm becomes incorrect.



In the case of the proper adjustment, the voltage is 40mV.

} Re-adjustment is required.

Speed drift is so great that the platter rpm may be as high as 45 rpm when the speed select switch is set to "33". → Diode D11 inside the motor is open.

When the diode D11 is shorted, the speed fluctuates and rpm increases by 5 to 6%. → Replace defective parts.

**Weak starting torque and long rise time**

Starting torque is weak, but a small push starts the turntable, which then runs correctly. → This condition is produced when one of the transistors from X1 through X8 is open. → Replace transistor(s) if defective.

Is power voltage of about 18.5±0.8V present at emitter of X101?

No → The Zener diode D105 or the transistor X101 are dedective.

# Exploded View of Cabinet Ass'y

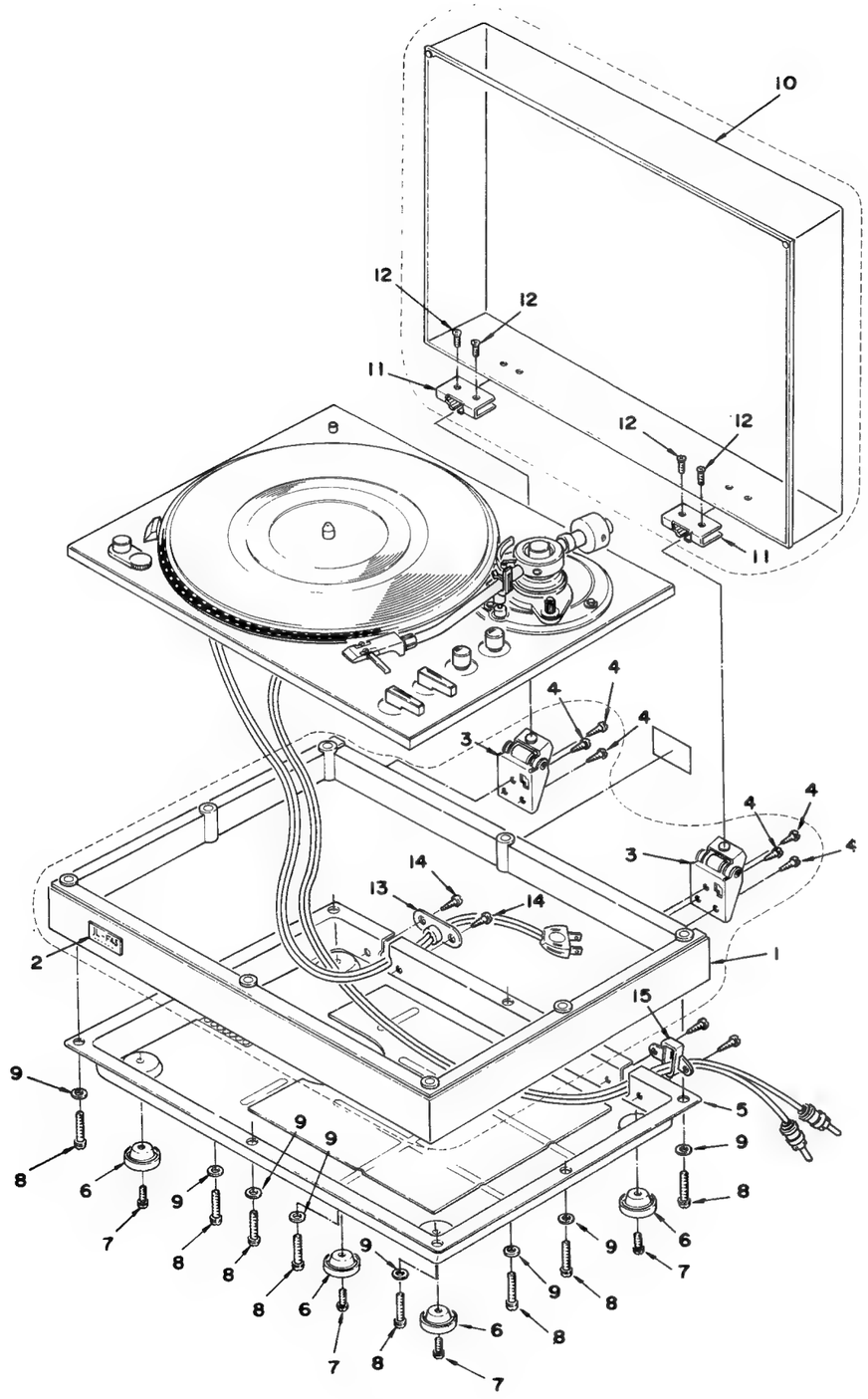



Fig. 25

# Parts List of Cabinet Ass'y

| NO. | PARTS NO. | PARTS NAME | REMARKS | Q'TY |
|---|---|---|---|---|
| 1 | E10098-008 | Cabinet Ass'y | J, C only | 1* |
| | " -009 | " | | 1* |
| 2 | E60480-004 | Mark | | 1* |
| 3 | E60989-001 | Hinge Ass'y | | 2 |
| 4 | SSSB3010M | Tapping Screw | | 6 |
| 5 | E10101-003 | Bottom Board | J, C only | 1* |
| | E10035-003 | " | | 1 |
| 6 | E60946-003 | Foot Ass'y | | 4 |
| 7 | LPSP4008ZS | Ass'y Screw | | 6 |
| 8 | LPSP4040MS | " | | 8 |
| 9 | WSS4000M | Washer | | 1 |
| 10 | E10036-003 | Dust Cover Ass'y | | 1 |
| 11 | E60990-001 | Lock Plate | | 2 |
| 12 | SHSP3010RS | Screw | | 4 |
| 13 | E49762-001 | Cord Stopper Plate | | 1 |
| 14 | QHS3876-162 | Cord Stopper | | 1 |
| 15 | E33944-001 | " | | 1 |

# Exploded View of Player Ass'y

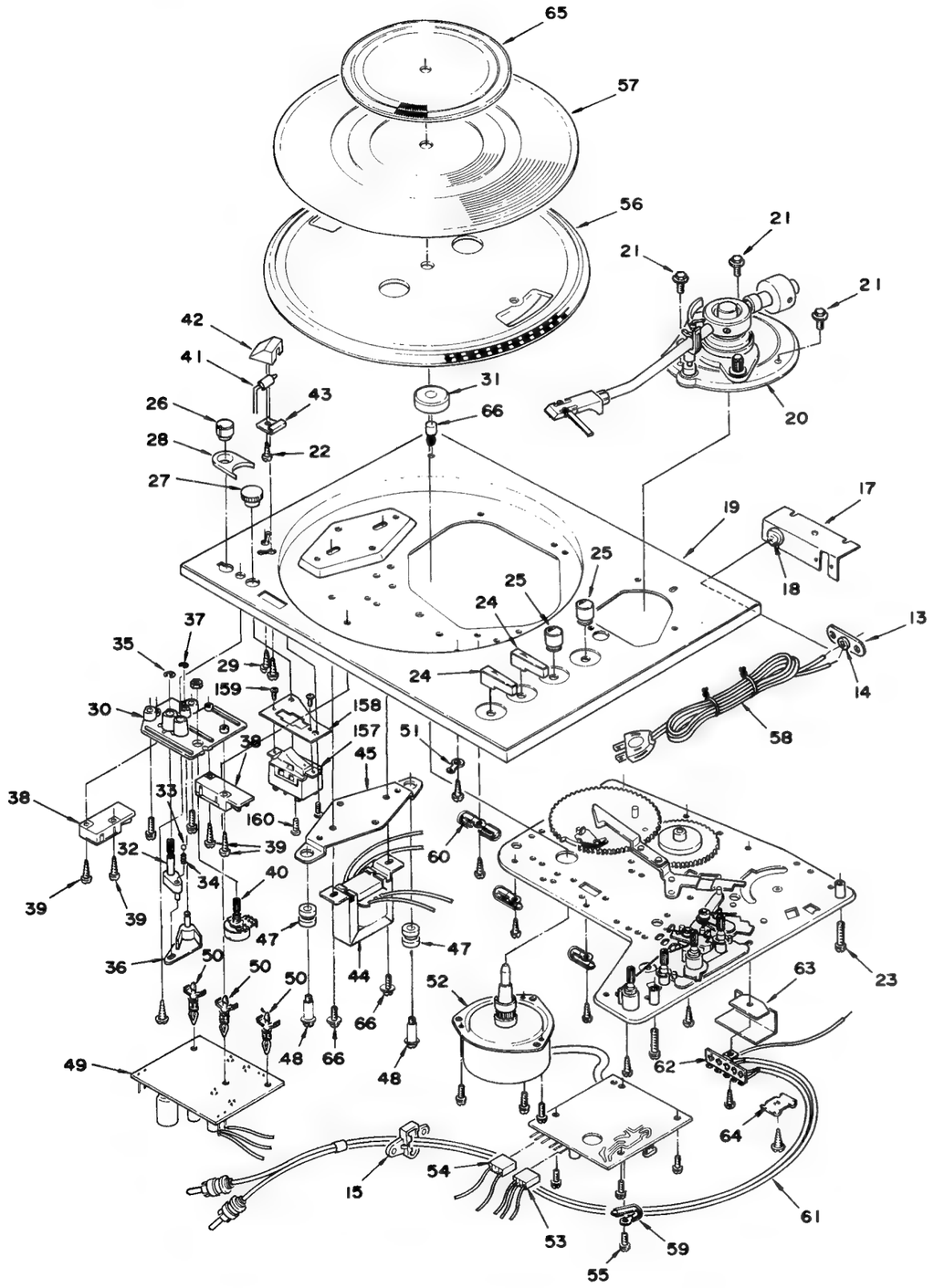



Fig. 26

# Parts List of Player Ass'y

| NO. | PARTS NO. | PARTS NAME | REMARKS | Q'TY |
|---|---|---|---|---|
| 16 | SBSB3008N | Tapping Screw | | 2 |
| 17 | E61277-001 | Bracket | | 1 |
| 18 | QHS3056-162 | Cord Stopper | | 1 |
| 19 | E10111-002 | Motor Board Ass'y | | 1* |
| | " -003 | " | BS only | 1* |
| 20 | ARM511 | Tonearm Ass'y | | 1 |
| | MP160SC | Pick-up Ass'y | P only | 1 |
| 21 | E60331-001 | Screw | | 3 |
| 22 | SBSB3006Z | Tapping Screw | | 5 |
| 23 | LPSP4022ZS | Screw | | 2 |
| 24 | E60667-001 | Knob | | 2 |
| 25 | E60669-001 | " | | 2 |
| 26 | E60995-001 | " | | 1 |
| 27 | E60996-001 | " | | 1 |
| 28 | E60997-001 | Knob Base | | 1 |
| 29 | SBSB3008Z | Tapping Screw | | 7 |
| 30 | E34512-001 | Switch Base | | 1* |
| 31 | E48820-001 | E.P Adaptor | | 1 |
| 32 | E60998-001 | Shaft Ass'y | | 1* |
| 33 | G41505-5 | Steel Ball | | 1 |
| 34 | E60488-001 | Spring | | 1 |
| 35 | REE5000 | E Ring | | 1 |
| 36 | E61000-001 | Switch Lever Ass'y | | 1* |
| 37 | REE3000 | E Ring | | 1 |
| 38 | QSM1V01-002 | Micro Switch | | 2 |
| 39 | SBSB3016Z | Tapping Screw | | 4 |
| 40 | QVF1A2B-013 | Volume | | 1 |
| 41 | QLN3104-001 | Neon Lamp | | 1* |
| 42 | E34513-001 | Lamp Cover | | 1* |
| 43 | E61002-001 | Lamp Holder | | 1* |
| 44 | E03032-23B | Power Transformer | J, C | 1* |
| | " -23C(BS) | " | E, A, BS | 1* |
| | " -23D | " | U, P | 1* |
| 45 | E61003-001 | Transformer Bracket | | 1* |
| 46 | GBSB3008M | Screw | | 2 |
| 47 | E61214-001 | Mount Rubber | | 2* |
| 48 | E49633-003 | Motor Holder | | 2* |
| 49 | TPS-61B | Power Circuit Ass'y | J, C | 1* |
| | " -61C | " | U, P | 1* |
| | " -61D | " | E | 1* |
| | " -61E | " | BS | 1* |
| | " -61F | " | A | 1* |
| 50 | E34530-002 | Circuit Board Holder | | 3 |
| 51 | 52396 | Terminal Lug | | 1 |
| 52 | MC-911H | Motor Ass'y | | 1* |
| 53 | E03681-0404 | Socket-wire Ass'y | | 1 |
| 54 | " -0405 | " | | 1 |
| 55 | LPSP3008ZS | Ass'y Screw | | 7 |
| 56 | E22039-001 | Platter | | 1* |
| 57 | E22113-001 | Platter Covering | | 1* |
| | " -002 | " | J, C only | 1* |
| 58 | QMP1200-244 | Power Cord | J, C, P, U | 1 |
| | QMP3910-244 | " | E | 1 |

| NO. | PARTS NO. | PARTS NAME | REMARKS | Q'TY |
|---|---|---|---|---|
| 58 | QMP2500-200 | Power Cord | A | 1 |
| | QMP9017-007BS | " | BS | 1 |
| 59 | E50670-005 | Wire Clamp | | 3 |
| 60 | E47203-004 | " | | 1 |
| 61 | G30062-005 | Signal Cord Ass'y | | 1 |
| 62 | QML1310-051 | Lug Strip Ass'y | | 1 |
| 63 | E60987-001 | Shield Cover | | 1 |
| 64 | G40437 | Wire Clamp | | 1 |
| 65 | E61136-001 | Strobo Plate | | 1* |
| 66 | E49633-001 | Adaptor Holder | | 1 |

# Exploded View of Mechanism Ass'y

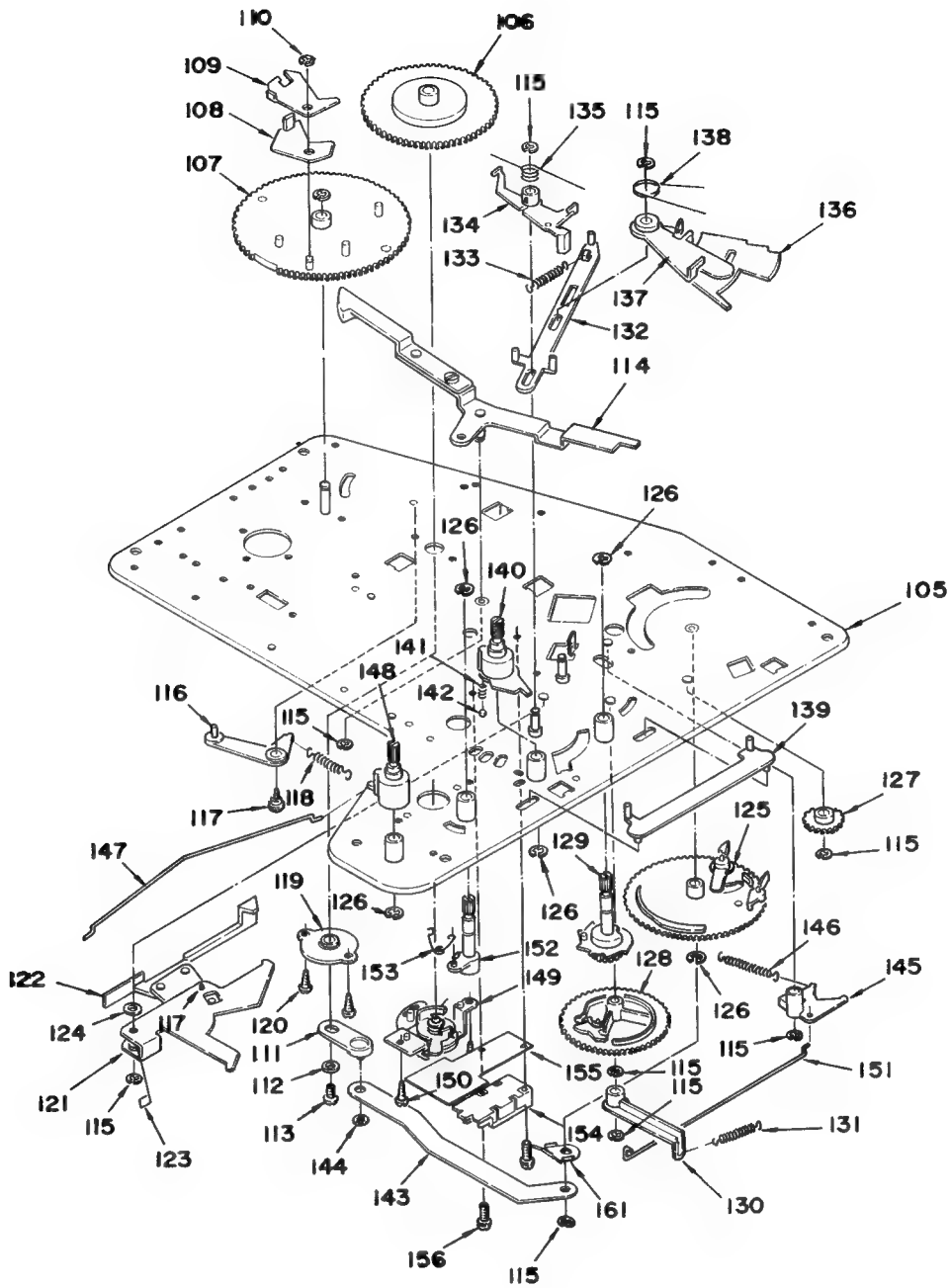



Fig. 27

# Parts List of Mechanism Ass'y

| NO. | PARTS NO. | PARTS NAME | REMARKS | Q'TY |
|---|---|---|---|---|
| 105 | E10034-003 | Base Sub Ass'y | | 1 |
| 106 | E60449-001 | Following Gear Ass'y | | 1 |
| 107 | E21913-002 | Main Gear Ass'y | | 1 |
| 108 | E60380-001 | Lower Trip Pawl | | 1 |
| 109 | E49627-001 | Engagement Pawl | | 1 |
| 110 | REE2000 | E Ring | | 1 |
| 111 | E60381-001 | Lever | | 1 |
| 112 | WNS3000N | Washer | | 1 |
| 113 | LPSP3008ZS | Ass'y Screw | | 8 |
| 114 | E34234-001 | Trip Ass'y | | 1 |
| 115 | REE3000 | E Ring | | 9 |
| 116 | E60383-001 | Stopper | | 1 |
| 117 | G41507-2 | Tapping Screw | | 2 |
| 118 | E60384-001 | Spring | | 1 |
| 119 | E60382-001 | Bushing | | 1 |
| 120 | SBSB3008Z | Tapping Screw | | 2 |
| 121 | E60395-001 | Reset Plate | | 1 |
| 122 | E60394-001 | Switch Plate Ass'y | | 1 |
| 123 | E60396-001 | Spring | | 1 |
| 124 | WNS4000 | Washer | | 1 |
| 125 | E34236-001 | Driving Gear Ass'y | | 1 |
| 126 | REE5000 | E Ring | | 5 |
| 127 | E60400-001 | " | | 1 |
| 128 | E60405-001 | Sub Gear Ass'y | | 1 |
| 129 | E34238-001 | " | | 1 |
| 130 | E60407-001 | " | | 1 |
| 131 | E60489-001 | Spring | | 1 |
| 132 | E60415-001 | Reject Plate | | 1 |
| 133 | E60416-001 | Spring | | 1 |
| 134 | E60417-001 | Reject Lever | | 1 |
| 135 | E60418-001 | Spring | | 1 |
| 136 | E60425-001 | Index Ass'y | | 1 |
| 137 | E60426-001 | Lever | | 1 |
| 138 | E60427-001 | Spring | | 1 |
| 139 | E60422-001 | Select Plate | | 1 |
| 140 | E60421-001 | Select Shaft Ass'y | | 1 |
| 141 | E60488-001 | Spring | | 1 |
| 142 | G41505-5 | Steel Ball | | 1 |
| 143 | E34237-001 | Link | | 1 |
| 144 | G4942-4 | Speed Nut | | 1 |
| 145 | E60390-001 | Elevator Ass'y | | 1 |
| 146 | E49596-001 | Spring | | 1 |
| 147 | E60428-001 | Rod | | 1 |
| 148 | E60429-001 | Start Shaft Ass'y | | 1 |
| 149 | E34240-001 | Cueing Ass'y | | 1 |
| 150 | SBSB3006Z | Tapping Screw | | 2 |
| 151 | E60414-001 | Rod | | 1 |
| 152 | E34239-001 | Cueing Cam Ass'y | | 1 |
| 153 | E49608-001 | Spring | | 1 |
| 154 | QSM1V01-018 | Micro switch | J, C, U, P | 1 |
| | " -022(BS) | " | E, A, BS | 1 |
| 155 | E60964-001 | Insulator Sheet | " | 1 |
| 156 | LPSP3014ZS | Ass'y Screw | J, C, U, P | 2 |

| NO. | PARTS NO. | PARTS NAME | REMARKS | Q'TY |
|---|---|---|---|---|
| 156 | SPKP3015Z | Plastic Screw | E, A, BS | 2 |
| 157 | QSE2235-203 | See Saw Switch | BS | 1 |
| 158 | E61157-001 | Bracket | " | 1 |
| 159 | LPSP3004NS | Ass'y Screw | " | 2 |
| 160 | LPSP4006NS | " | " | 2 |
| 161 | E60900-001 | Cushion Spring | | 1 |

# Exploded View of Pick-Up Ass'y

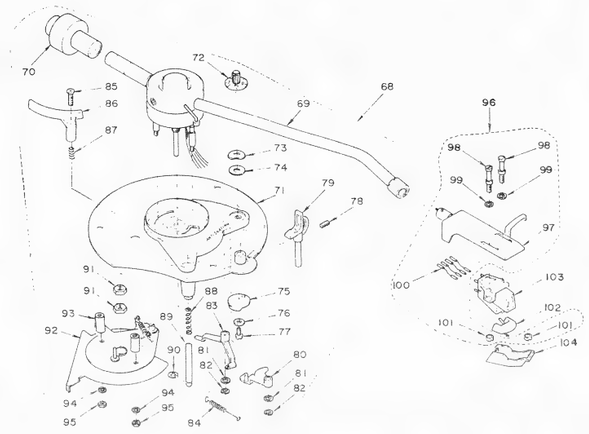


Fig. 28

# Parts List of Pick-Up Ass'y

| NO. | PARTS NO. | PARTS NAME | REMARKS | Q'TY |
|---|---|---|---|---|
| 68 | E21917-001 | Arm Base Ass'y | | 1 |
| 69 | E21985-001 | Arm Ass'y | | 1 |
| 70 | E34253-001 | Main Weight Ass'y | | 1 |
| 71 | E21909-001 | PU Base Sub Ass'y | | 1 |
| 72 | E60327-001 | Anti-skating Knob Ass'y | | 1 |
| 73 | E49602-002 | Wave Washer | | 1 |
| 74 | G4517-1 | 〃 | | 1 |
| 75 | E34258-001 | Anti-skating Cam | | 1 |
| 76 | WSS2000Z | Washer | | 1 |
| 77 | SPSP2005Z | Screw | | 1 |
| 78 | TRS3003MS | Set Screw | | 1 |
| 79 | E60326-001 | Arm Rest Ass'y | | 1 |
| 80 | E60472-001 | Anti-skating Cam Lever | | 1 |
| 81 | WNB2600N | Washer | | 2 |
| 82 | REE2000 | E Ring | | 2 |
| 83 | E60473-001 | Anti-skating Lever | | 1 |
| 84 | E60474-001 | Anti-skating Spring | | 1 |
| 85 | SSSP3016MS | Screw | | 1 |
| 86 | E60475-001 | Elevator Ass'y | | 1 |
| 87 | E49649-001 | Spring | | 1 |
| 88 | E61194-001 | 〃 | | 1 |
| 89 | E49655-003 | Elevator Shaft | | 1 |
| 90 | REE3000 | E Ring | | 1 |
| 91 | G5053 | Nut | | 2 |
| 92 | E34241-001 | Arm Lever Ass'y | | 1 |
| 93 | E60966-001 | Spacer | | 2 |
| 94 | WLS3000 | Spring Washer | | 2 |
| 95 | NTB3000 | Nut | | 2 |
| 96 | PH-6L | Headshell Ass'y | | 1 |
| 97 | E34265-001 | Headshell | | 1 |
| 98 | E60502-001 | Screw | | 2 |
| 99 | EG82971 | Washer | | 1 |
| 100 | E60501-001 | Wire Ass'y | | 1 |
| 101 | E60503-001 | Nut | | 2 |
| 102 | 4DT-Z1S | Stylus | P only | 1 |
| 103 | MD1025Z | Cartridge | 〃 | 1 |
| 104 | E34268-001 | Stylus Cover | 〃 | 1 |

# Circuit Board Ass'y

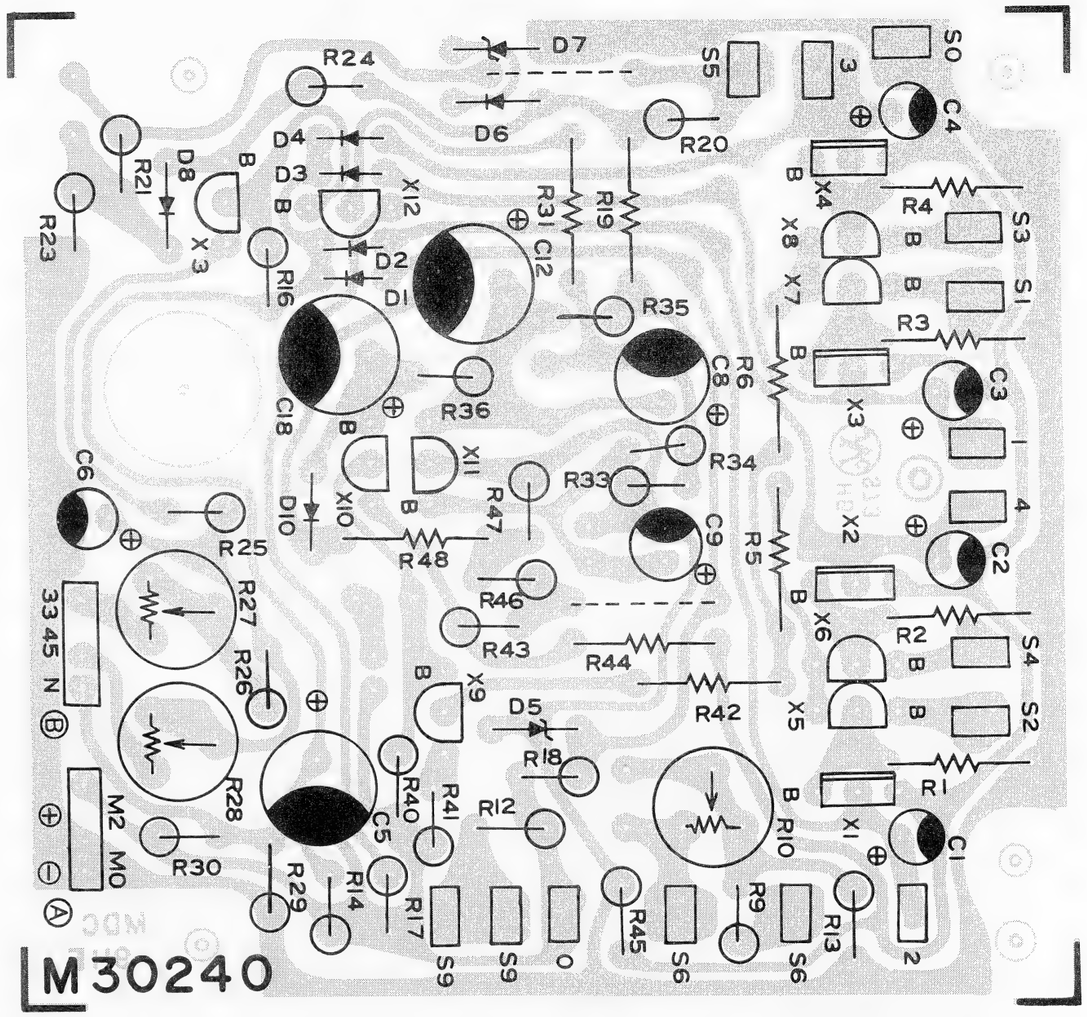



Fig. 29

# Parts List of Circuit Board Ass'y

| | PARTS NO. | PARTS NAME | REMARKS | Q'TY |
|---|---|---|---|---|
| | M30240 | Circuit Board | | 1 |
| | E03686-003B | Plug Ass'y | | 2 |
| X1~4 | 2SD571L or K | Transistor (NEC) | | 4 |
| X5~9 | 2SA733P or Q | 〃 | | 5 |
| X11,12 | 2SA733K | 〃 | | 2 |
| X10,13 | 2SC945K or P | 〃 | | 2 |
| D5 | RD-8.2EE | Zener Diode | | 1 |
| D7 | RD-5.6ED | 〃 | | 1 |
| D1~4 | 1S953A | Diode | | 4 |
| D6 | VD1122 | 〃 | | 1 |
| D8 | VD1220 | 〃 | | 1 |
| D10 | VD1121 | 〃 | | 1 |
| C1~4 | QEW41HA-105 | E. Capacitor | | 4 |
| C5 | QEW41CA-107 | 〃 | | 1 |
| C6 | 〃 -335 | 〃 | | 1 |
| C12,18 | QEB41CM-106 | 〃 | | 2 |
| C8 | QEB41EM-475 | 〃 | | 1 |
| C9 | 〃 -225 | 〃 | | 1 |
| R27 | QVZ3501-472 | Volume | | 1 |
| R28 | 〃 -332 | 〃 | | 1 |
| R10 | QVP4A0B-101 | 〃 | | 1 |
| R16 | QRX148F-1202 | O.M. Resistor | ½W | 1 |
| R25 | 〃 -9101 | 〃 | | 1 |
| R45 | QRD121J-2R7 | Carbon Resistor | ½W | 1 |
| R12,13 | 〃 -331 | 〃 | 〃 | 2 |
| R9 | QRD143J-470 | 〃 | | 1 |
| R14 | 〃 -273 | 〃 | | 1 |
| R17,18 | 〃 -821 | 〃 | | 2 |
| R20 | 〃 -392 | 〃 | | 1 |
| R21,23 | 〃 -102 | 〃 | | 2 |
| R24 | 〃 -562 | 〃 | | 1 |
| R26,40,47 | 〃 -332 | 〃 | | 3 |
| R29 | 〃 -681 | 〃 | | 1 |
| R30 | 〃 -564 | 〃 | | 1 |
| R33 | 〃 -153 | 〃 | | 1 |
| R34 | 〃 -123 | 〃 | | 1 |
| R35 | 〃 -393 | 〃 | | 1 |
| R46 | 〃 -183 | 〃 | | 2 |
| R41 | 〃 -101 | 〃 | | 1 |
| R43 | 〃 -472 | 〃 | | 1 |
| R1~4 | QRD141J-101 | 〃 | | 4 |
| R5,6 | 〃 -680 | 〃 | | 2 |
| R19 | 〃 -561 | 〃 | | 1 |
| R31 | 〃 -573 | 〃 | | 1 |
| R42 | 〃 -122 | 〃 | | 1 |
| R44 | 〃 -471 | 〃 | | 1 |
| R8 | 〃 -123 | 〃 | | 1 |
| | 〃 -0R0 | 〃 | | 1 |

# Power Circuit Board Ass'y

TPS-61B (for U.S.A. and Canada)

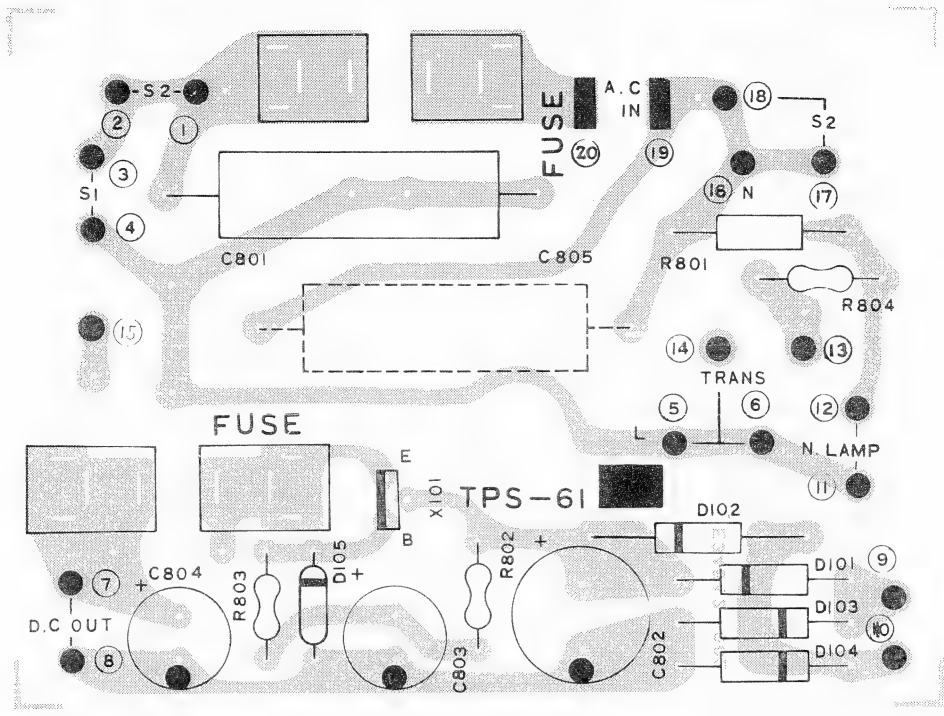



Fig. 30

TPS-61C or D or F (for Europe, Pacex, Australia and Other Countries)

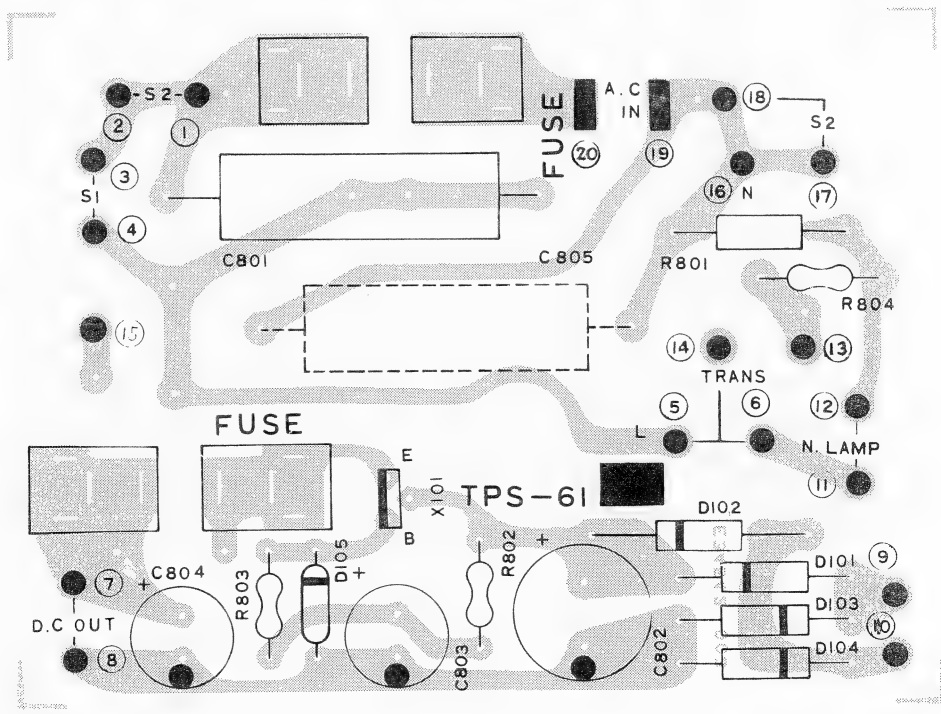



Fig. 31

TPS-61EBS (for U.K.)

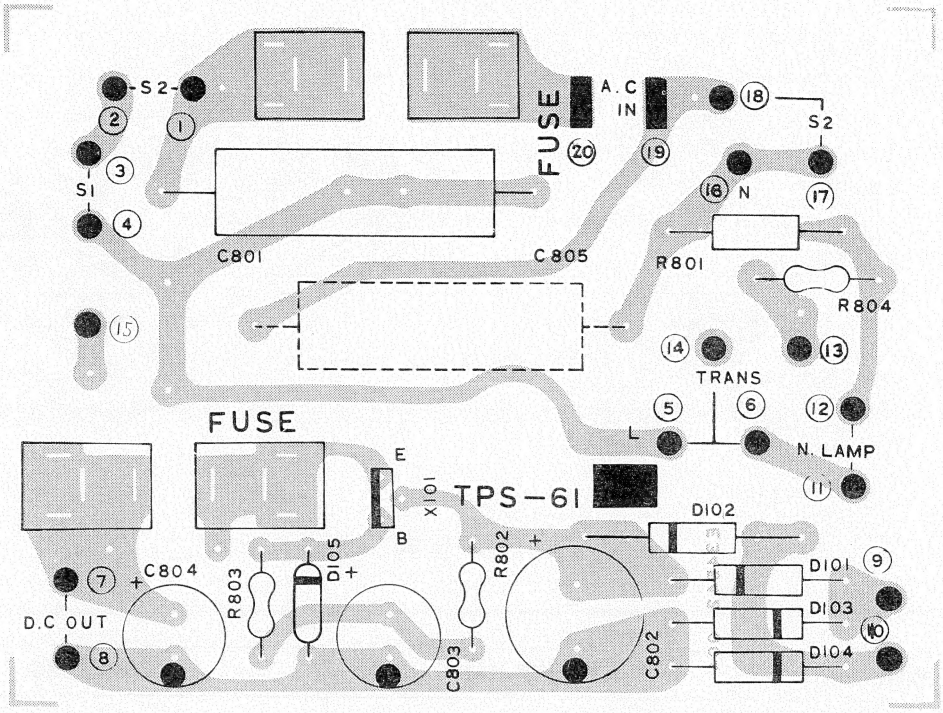



Fig. 32

# Parts List of Power Circuit Board Ass'y

| | PARTS NO. | PARTS NAME | REMARKS | Q'TY |
|---|---|---|---|---|
| | TPS-61B | Circuit Board Ass'y | J, C | 1 * |
| | TPS-61C or D or F | " | U, P, E, A | 1 * |
| | TPS-61EBS | " | BS | 1 * |
| X101 | 2SD325(E) | Transistor | | 1 |
| D101~104 | SIB01-02 | Silicon Diode | | 4 |
| D105 | WZ-192 | Zener Diode | | 1 |
| R801 | QRG017J-153 | UNF. O.M. Resistor | J, C | 1 |
| | QRG027J-333 | " | E, A, BS | 1 |
| | QRG017J-103 | " | U, P | 1 |
| R802,803 | QRD126J-331 | UNF. Carbon Resistor | | 2 |
| | QRD141J-0R0 | Carbon Resistor | J, C, U, P | 1 |
| C801 | QFH72BM-473 | M.M. Capacitor | J, C | 1 |
| | QFH53AM-473 | " | U, P | 1 |
| | QFZ9007-473(BS) | O.F.T. Capacitor | E, A, BS | 1 |
| C805 | " | " | BS | 1 |
| C802 | QEW41VA-477 | E. Capacitor | | 1 |
| C803 | " -107 | " | | 1 |
| C804 | QEW41HA-476 | " | | 1 |
| | E45524-001 | Contact Clip | J, C, U, P | 2 |
| | E48965-002 | Fuse Clip | E, A, BS | 4 |
| | E40130-001 | Tab | | |
| | E43727-002 | " | | |
| | QMF60S1-R30 | Fuse | U, P | 1 |
| | QMF60R1-R20 | " | " | 1 |
| | QMF61U2-R30 | " | J, C | 1 |
| | QMF51A2-R20(BS) | " | E, A, BS | 1 |
| | " -R50(BS) | " | " | 1 |

# Final Packing Ass'y

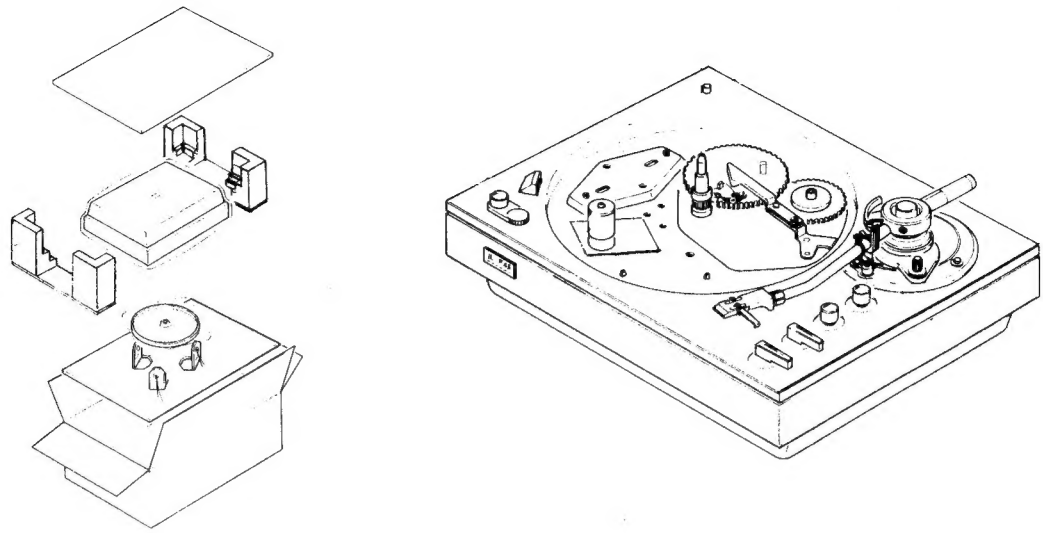


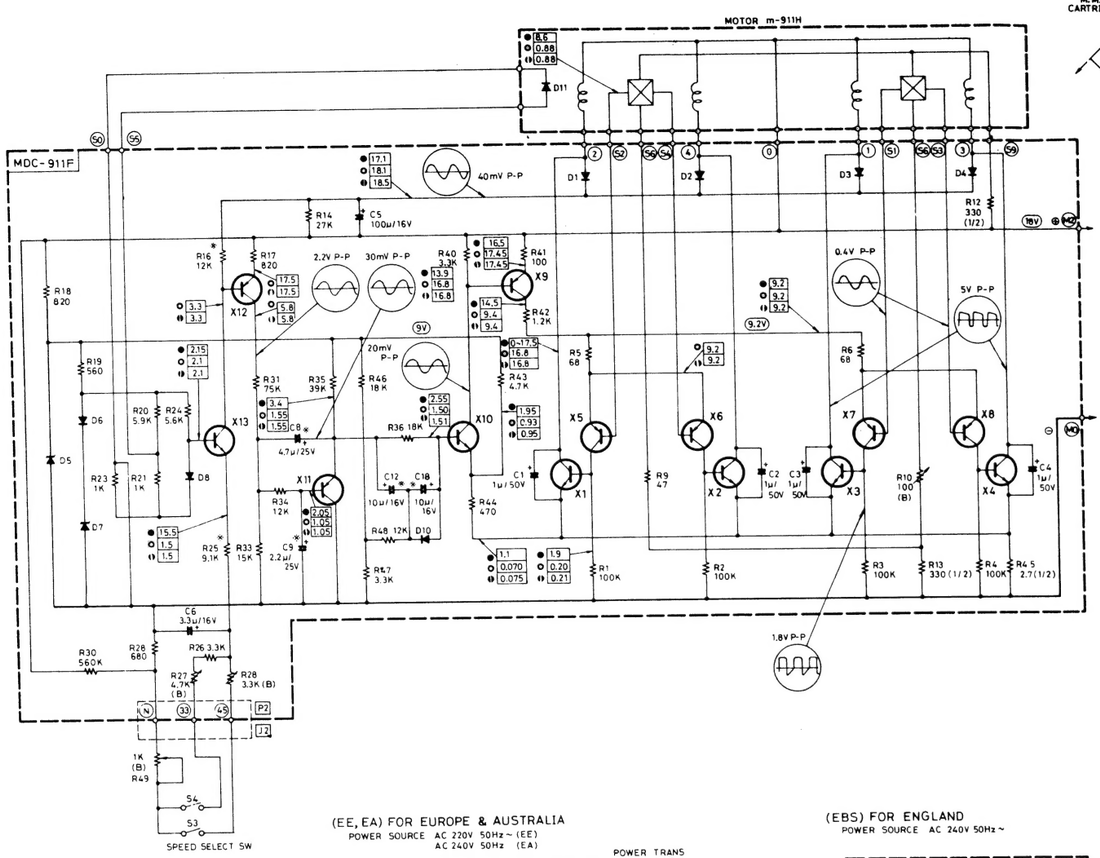
Fig. 33

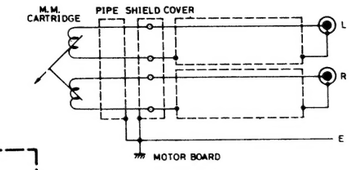
| NO. | PARTS NO. | PARTS NAME | REMARKS | Q'TY |
|---|---|---|---|---|
| | Q04141-3-N | Vinyltie | | 1 |
| | Q04141-4-N | " | | 1 |
| | QPGA040-05005 | Envelope | for Platter | 1 |
| | E34054-005 | Nylon Cover | for Model JL-F45 | 1 |
| | E60682-001 | Weight Box | | 1 |
| | SPSP4060AS | Screw | | 1 |
| | E48722-002 | Caution Label | | 1 |
| | Q03031-113 | Washer | | 1 |
| | JL-F45-PK | Carton Box | | 1* |
| | JL-F45-NZ | Packing Materials | | 1* |
| | E36997-020 | Protect Sheet | | 1 |
| | E61225-001 | Hinge Pad | | 2 |

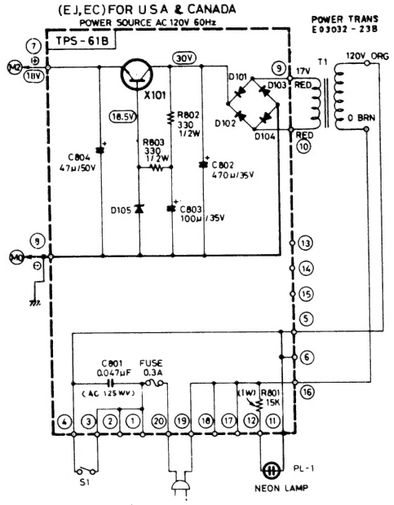
# Accessories

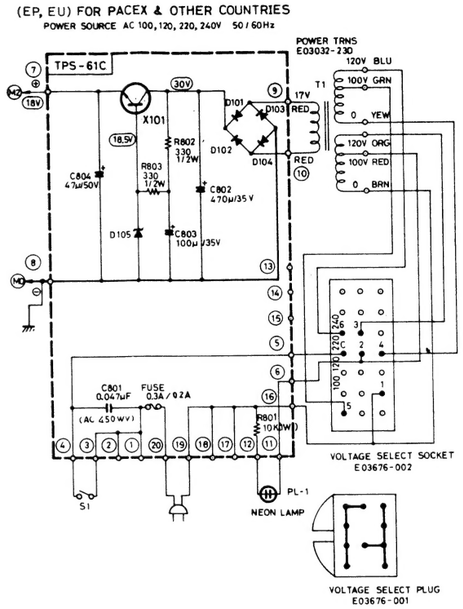
| NO. | PARTS NO. | PARTS NAME | REMARKS | Q'TY |
|---|---|---|---|---|
| | E30580-530A,ABS | Inst. Book | BS→ABS | 1 |
| | BT20022B | Warranty Card | J | 1 |
| | BT20025 | " | C | 1 |
| | BT20014 | " | P | 1 |
| | BT20029 | " | A | 1 |
| | BT20013B | " | B | 1 |
| | BT20012 | Service Pro. | J | 1 |
| | BT20024 | Do It Better | " | 1 |
| | E48820-001 | E.P. Adaptor | | 1 |
| | E61136-001 | Strobo Plate | | 1* |
| | E64207-001 | Envelope | | 1 |
| | QMF60S1-R30 | Fuse | U, P only | 1 |
| | QMF60R1-R20 | " | " | 1 |
| | E64208-001 | Envelope | " | 1 |
| | E7958-W | Fuse Label | " | 1 |

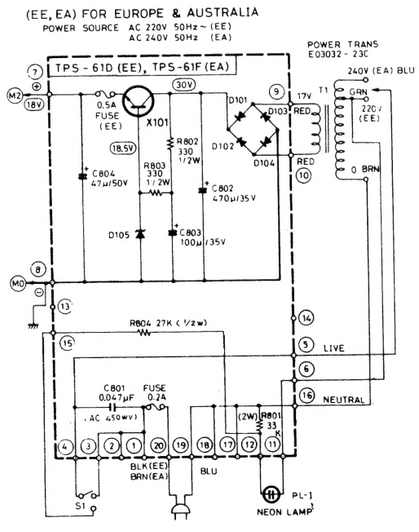
# Schematic Diagram of JL-F45

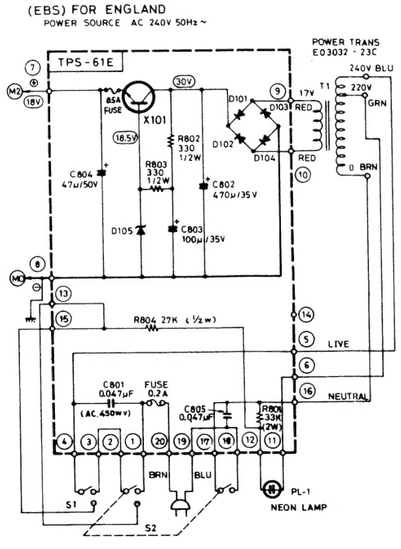


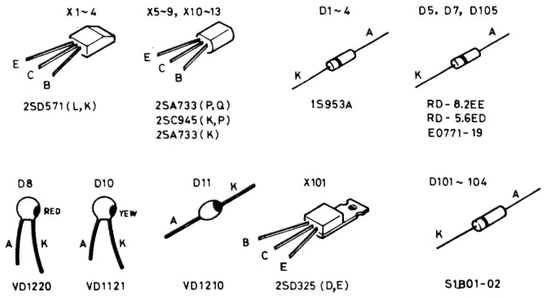




| | | | |
|---|---|---|---|
| X1~4 | 2SD571 (L,K) | X101 | 2SD325 (D,E) |
| X5~9 | 2SA733 (P,Q) | | |
| X10, X13 | 2SC945 (K,P) | | |
| X11, X12 | 2SA733 (K) | | |
| D1~4 | 1S953A | D101~104 | S1B01-02 |
| D5 | RD-8.2EE | D105 | E0771-19 |
| D7 | RD-5.6ED | | |
| D6 | VD1120 | | |
| D8 | VD1220 | | |
| D10 | VD1121 | | |
| D11 | VD1210 | | |




**Notes:**

1. Hall elements ( ⊗ ) and D11 (VD1121) are installed inside the motor, and not included in the motor drive and power circuits.
2. The following parts should be first bonded with each other with a silicon adhesive (KE45RTV made by SHINETSU KAGAKU).
   * D1-D4 and X12
   * D6 and D7
   * D8 and X13
3. D1 through D4 should be of the same rank having an equal hfe.
4. The indicated voltages are measured by a tester having an internal impedance of 20k ohms/V. (Rated voltage 18±2V)
   - ● when locked
   - ○ for 33-1/3 rpm
   - ◐ for 45 rpm
5. Switch conditions when the speed select knob is at "STOP": for 33-1/3 rpm, S2 – ON and S3 – OFF
   for 45 rpm, S2 – OFF and S3 – ON.
6. —— indicates B voltage (+).
7. ⟶ indicates the signal path.
8. Circuits and circuit constants are subject to change without notice for improvement.

**Fig. 34**

# Specifications

**TURNTABLE**

| | |
|---|---|
| Type: | Fully Automatic Mechanism |
| Drive system: | Direct Drive |
| Drive Motor: | D.C. Servo Motor |
| Speeds: | 33-1/3 and 45 rpm |
| Wow and Flutter (WRMS): | Less than 0.05% (DIN) |
| Signal to noise ratio: | More than 60dB (IEC-B)<br>70dB (DIN-B) |
| Pitch control range: | More tahn ±2.5% |
| Platter: | 12-inch (31.1cm)<br>Die-cast aluminum alloy |

**TONEARM**

| | |
|---|---|
| Type: | Statically-balanced S-shaped tubular arm with JVC developed TH(Tracing Holed) balancing system and with tracking force dial of 0.1 gram steps |
| Effective arm length: | 220mm |
| Overhang: | 15mm |
| Applicable Tracking force range: | 0 to 3 grams |
| Applicable cartridge weight: | 14-24 grams (Include Headshell) |
| Tracking error: | +3° 35′, –0° 43′ |

**GENERAL**

| | |
|---|---|
| Dimension: | 46.0(W) x 36.8(D) x 13.0(H) cm<br>(18-1/8 x 14-1/2 x 5-1/8 inch) |
| Weight: | 11.0 Kg<br>(9.0 Kg for U.S.A. and CANADA) |

**POWER SPECIFICATIONS** **TABLE 1**

| Countries | Line Voltage & Frequency | Power Consumption |
|---|---|---|
| U.S.A., CANADA | AC 120V, 60Hz | 5.6 watts |
| EUROPE CONTINENT | AC 220V~, 50Hz | 5.6 watts |
| U.K., AUSTRALIA | AC 240V~, 50Hz | 5.6 watts |
| U.S. MILITARY MARKET | AC 110~120V/220~240V Selectable, 50/60Hz | 5.6 watts |
| OTHER AREAS | AC 110~120V/220~240V Selectable, 50/60Hz | 5.6 watts |